

CLAIMS

What is claimed is:

1. For a surgical navigation system a method of forming an electromagnetic sensing coil in a medical instrument, comprising:
 - forming a core;
 - forming a coil about the core;
 - electrically isolating the coil from the core;
 - covering the core and the coil with a layer of a material;
 - wherein the coil and the core are substantially electrically isolated from an environment.
2. The method of claim 1, wherein electrically isolating the coil from the core includes:
 - covering the core with a second layer of a material.
3. The method of Claim 1, further comprising:
 - selecting a material to form the core;
 - wherein selecting a material includes selecting a permeable material.
4. The method of Claim 1, wherein forming a core includes:

forming the core including a diameter of less than about 2 millimeters.

5. The method of Claim 2, wherein covering the core with the second layer occurs prior to forming the coil.

6. The method of Claim 1, wherein forming the coil includes forming a first coil and forming a second coil of a wire around said core being covered with the first layer of the material.

7. The method of Claim 1, wherein covering the formed coil includes substantially covering the formed coil to isolate the formed coil from an exterior environment.

8. The method of Claim 1, wherein forming the core includes forming a guidable portion of a stylet, a suction tube, a core for a probe, a core for a catheter, a core for an ablation tip, a core for a lens, and combinations thereof.

9. The method of Claim 1, further comprising:
selecting the material for the first layer and selecting the material for the second layer;
wherein the material for at least one of the first layer and the second layer is dielectric.

10. The method of Claim 1, wherein covering the core with the first layer of material includes covering the formed core with at least about 0.0005 inches of the material.

11. In a surgical navigation system a substantially minimally invasive dynamic reference frame for dynamically referencing portions of an anatomy, comprising:

- a body portion selectively attachable to a portion of the anatomy;
- a navigation portion to at least one of sense and transmit a characteristic; and

- a holding section to hold said body portion relative to the portion of the anatomy;

wherein said holding section substantially non-invasively holds said body portion relative to the portion of the anatomy.

12. The surgical navigation system of Claim 11, wherein said body portion includes an adhesive receiving section;

wherein said adhesive receiving section allows for the placement of the adhesive between said body portion to be affixed to the portion of the anatomy.

13. The surgical navigation system of Claim 11, wherein said characteristic includes at least one of an optical characteristic, a electro-magnetic characteristic, an acoustic characteristic, a light characteristic, and combinations thereof.

14. The surgical navigation system of Claim 11, wherein said navigation portion includes at least one coil to at least one of transmit and receive an electro-magnetic field.

15. The surgical navigation system of Claim 14, further comprising at least two coils positioned at an angle relative to one another;

wherein a plurality of degrees of freedom of movement of the navigation portion can be determined.

16. The surgical navigation system of Claim 11, wherein said holding section includes a tensioning member extending from said body portion to engage at least one of the portion of the anatomy or an area adjacent to a portion of the anatomy.

17. The surgical navigation system of Claim 11, wherein said holding section is operable to substantially eliminate dermal shift when said body portion is selectively attached to the portion of the anatomy.

18. The surgical navigation system of Claim 11, wherein said holding section includes a substantially moldable material that may be molded to a selected shape;

wherein said holding section is operable to substantially accurately repeatably engage the portion of the anatomy.

19. The surgical navigation system of Claim 11, further comprising:
 - a fiducial marker portion.
20. The surgical navigation system of Claim 11, wherein said holding section is contoured to the selected portion of the anatomy to allow for substantially repeatable placement of the holding section.

21. In a surgical navigation system for navigating a procedure relative to a patient having an electrical isolating portion, comprising:

an electrical source;

an instrument including a conducting element disposable near the patient;

a transmission medium interconnecting said electrical source and said instrument; and

an electrical isolator to electrically isolate said instrument from said electrical source.

22. The surgical navigation system of Claim 21, wherein said instrument is selected from at least one of an electro-magnetic sensor, a probe, a stylet, an electroencephalogram contact, and combinations therefore.

23. The surgical navigation system of Claim 21, wherein said conducting element includes a navigation sensor for allowing a production of an induced field in the navigation sensor.

24. The surgical navigation system of Claim 21, wherein said electrical isolator includes a transformer having an input side and an output side.

25. The surgical navigation system of Claim 24, wherein said transformer may be a step up transformer between at least said input said and said output side.

26. The surgical navigation system of Claim 21, further comprising at least one of a navigation probe interface, a navigation probe, and combinations thereof.

27. The surgical navigation system of Claim 26, wherein said electrical isolator may be disposed in at least one of said probe, surgical instrument, conducting elements, said line, and said navigation probe interface.